

**REMARKS**

Claim 8 has been amended to state that the catalyst, after contacting with the acid, is aged while wet.

Claim 10 has been amended to depend from any of claims 1, 2, 8, or 9.

Claims 11 and 12 have been amended to insert the word “of” between one and claims. Applicants inadvertently deleted of when making their previous amendments.

Claim 14 has been amended to reflect that the claim depends from “any one of” claims 1, 2, 8, or 9.

No new matter has been added through these amendments.

**WITHDRAWAL OF FINALITY**

Applicants respectfully submit that the Examiner has improperly issued a Final Office Action. In the present application, the Examiner has presented additional rejections over additional references, such rejections and references not appearing in the prior office action. While the Examiner contends that applicants amendments necessitated the new rejection and thus the finality is correct, applicants respectfully disagree, and applicants respectfully submit that the new grounds for rejection were not necessitated by applicants’ amendments. The Examiner has rejected claims 1 and claims 2 in the new ground for rejection, and no amendments were submitted for these claims. In fact, these claims have not been amended in any way and are the original claims as submitted with the application. Thus, since no amendments were ever made to these claims, it can hardly be submitted that applicants’ amendments formed the basis for the new rejection(s).

Further, with regards to claims 4-9 and 11-15, applicants’ amendments submitted in their prior response merely corrected the dependency of claims, i.e. multiple dependent claims depending from multiple dependent claims. Thus, it can hardly be said that merely amending claims to correct multiple dependent claims from depending from other multiple dependent claims somehow necessitated a new ground for rejection.

In addition, the reference relied upon by the Examiner was not submitted by applicants in an IDS.

Thus, applicants take the position that the Examiner has improperly issued a Final Office Action in the present application, and applicants request that the Examiner withdraw the finality of the Office Action.

**CLAIM OBJECTIONS**

**EXAMINER'S POSITION**

Claim 10 has been objected to under 37 C.F.R. 1.75(c) as being in improper form because of multiple dependent claims depending from other multiple dependent claims.

**APPLICANTS' POSITION**

Claim 10 has been amended such that no multiple dependent claims depend from multiple dependent claims.

The Examiner is requested to withdraw this objection.

**CLAIM REJECTIONS**

**REJECTION UNDER 35 U.S.C. 112(SECOND PARAGRAPH)**

Claim 8 has been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**EXAMINER'S POSITION**

The Examiner takes the position that "the catalyst composition containing the acid" lacks antecedent basis.

**APPLICANT'S POSITION**

Claim 8 has been amended to state the catalyst after contacting with the acid is subjected to an aging step while wet.

The Examiner is requested to reconsider and withdraw this rejection.

**FIRST REJECTION UNDER 35 U.S.C. 103**

Claims 1-3 have been rejected under 35 U.S.C. 103(a) as being obvious in light of United States Patent Number 5,389,592, Weismann, et al. ("Weismann").

**EXAMINER'S POSITION**

The Examiner takes the position that Weismann teaches a method for enhancing regenerated hydroprocessing catalysts. The active metals for these types of catalysts include those of the Group VIB and Group VIII metals, and most commonly Ni, Co, Mo, and W, citing col. 2, lines 2-10. The process utilizes a boron containing compound as well as solvents, such as alcohols, and the examiner states that the alcohols are equivalent to the claimed organic additives. The examiner continues that alcohols are typically miscible in water and include those having boiling points between 80-500°C. The Examiner cites isopropyl alcohol as having a boiling point of 82.3oC. The Examiner also

continues, citing claim 6, that the boron containing compound can be boric acid, thus teaching contacting the catalyst with an acid.

The Examiner notes that the crystalline fraction of the catalyst is not discussed in Weismann, but takes the position that one having ordinary skill in the art would have performed these reactivation processes to any suitable catalyst, including amorphous or crystalline.

In the "Response to Arguments" section of the office action, the Examiner takes the position that any judgment of obviousness is based on hindsight reasoning, and so long as it takes into account only knowledge which was within the level of skill of one having ordinary skill in the art and does not include knowledge gleaned from applicants' disclosure, such a reconstruction is proper, citing *In re McLaughlin*. The Examiner continues that the discussion of an example alcohol that meets the additive criteria was merely to show the overlap of the instant claims and the prior art, and the showing of unexpected results would need to be directly shown to differentiate this prior art process.

#### **APPLICANTS' POSITION**

It is applicants' position that one having ordinary skill in the art and knowledge of Weismann at the time the invention was made would not have found it obvious to arrive at the presently claimed invention.

It is important to note that there are many organic additives suitable for use in the instant invention, and that the arguments presented herein and previously with regards to alcohols are being presented because this is the only organic additive overlapping with Weismann.

While the Examiner contends that hindsight is not being improperly used in the instant rejection, applicants again respectfully disagree. Weismann is completely silent as to the solubility of the alcohols suitable for use in his process. Weismann is also completely silent as to the boiling points of alcohols suitable for use in his process. Applicants submitted arguments in their previous response showing that alcohols are a broad class of compounds, and not all alcohols satisfy the solubility and boiling point limitations present in the instant claims. It is only with the use of improper hindsight gained from the instant application that an alcohol meeting the solubility and boiling point limitations of the organic additives suitable for use in the instant invention can be inserted into the disclosure of Weismann.

Applicants again submit that the present invention relates to a process for activating a hydrotreating catalyst comprising a Group VIB metal oxide and a Group VIII metal oxide. This

process involves contacting a catalyst with an acid and an organic additive. The organic additive has a boiling point in the range of 80-500°C and a solubility in water of at least 5 grams per liter, measured at 20°C and atmospheric pressure. After this contacting, the process can include an optional drying under conditions such that at least 50 wt % of the additive is maintained in the catalyst.

As noted above, Weismann is completely silent as to the boiling and/or the water solubility of the alcohols used therein. In fact, Weismann simply states that alcohols can be used. Thus, applicants take issue with the Examiner's specific selection of alcohols based on the teachings of Weismann and respectfully note that the Examiner is improperly using hindsight. There are many alcohols that have a boiling point outside of the presently claimed range of 80-500°C, and these alcohols are miscible in water, which meets the solubility in water limitations of the present claims. For example, methanol has a boiling point of 65°C and ethanol has a boiling point of 78°C, and both are miscible in water, meaning that they are soluble in all proportions. Pentan-1-ol, Pentan-2-ol, Hexanol, Heptanol, Octanol, Nonol, and Decanol have boiling points within the presently claimed range, but their solubility in water is well outside of the presently claimed range. All of the alcohols would fall under the disclosure and teachings of Weismann, and all would be suitable for use in the process of Weismann. Since Weismann contains no teaching concerning how to select alcohols based on boiling point and solubility, it is only with the use of improper hindsight that one having ordinary skill in the art would know to select an alcohol for use in the Weismann process that meets the limitations of the organic additives suitable for use in the present invention.

Thus, as noted previously, not all alcohols meet the limitations of the organic additives suitable for use in the present invention. In particular, not all alcohols satisfy the current claim limitations that the organic additive used in the present invention have a boiling point in the range of 80-500°C and a solubility in water of at least 5 grams per liter, measured at 20°C and atmospheric pressure. The Examiner's selection of an alcohol for use in Weismann that meets the present claim requirements regarding boiling point and solubility is only possible because of the present teachings. Further, as demonstrated in the present examples, there is a synergistic effect noted when employing an acid and an organic additive as is presently claimed. The Examiner is requested to reconsider and withdraw this rejection.

**SECOND REJECTION UNDER 35 U.S.C. 103**

Claims 1, 2, 4-9 and 11-15 have been rejected under 35 U.S.C. 103(a) as being obvious in light of United States Patent Number 6,239,054, Shukis, et al. ("Shukis").

**EXAMINER'S POSITION**

The Examiner takes the position that Shukis teaches a process for regenerating a spent catalyst comprising a support by wetting the support with a chelating agent in a carrier liquid and then aging the wetted support before drying, pointing to claim 1. Hydrotreating catalysts that may benefit from this process are usually a combination of Group VIB and Group VIII metals impregnated onto an alumina substrate, citing col. 1, lines 61-67. The process may be applied to the catalyst at any point during use and production after the alumina support is made and also can be used to improve activity during regeneration. Thus, the Examiner takes the position that Shukis teaches the use of the process therein with fresh and spent catalysts. The Examiner continues that appropriate chelating agents include acetic acids and ethylene glycol (Table 4), and also citric acid (Table 1), and that ethylene glycol is miscible in water, contains two OH groups, and has a boiling point of about 197°C. The Examiner continues that Shukis teaches the amount of chelating agent is not critical, but the amount will affect the degree of the affect. The Examiner takes the position that the general disclosure of Shukis provides that the chelating agent should be present in an amount of 0.01-1.0 grams of agent per gram of catalyst, leading to a ratio of 1:100-1:1.

The Examiner notes that the crystalline fraction of the catalyst is not discussed in Shukis, but takes the position that one having ordinary skill in the art would have performed these reactivation processes to any suitable catalyst, including amorphous or crystalline.

The Examiner also takes the position that it would have been obvious to use a combination of two or more agents discussed in Shukis. The Examiner thus takes the position that Shukis is found to teach the treatment of a hydrotreating catalyst with an acid and an organic additive.

**APPLICANTS' POSITION**

It is applicants' position that one having ordinary skill in the art and knowledge of Shukis at the time the invention was made would not have found it obvious to arrive at the presently claimed invention.

Shukis is a process designed to form a particular nanocrystallite phase in the catalyst, col. 2, line 64- col. 3, line 8. In its broadest teaching, the process comprises wetting the catalyst composition by contact with a chelating agent in a carrier liquid, aging the so wetted substrate while

wet, drying the so-aged substrate at a temperature and under conditions to substantially volatilize the carrier liquid, and calcining the so-dried substrate, see col. 3, lines 33-48 and col.5, lines 25-36. Suitable chelating agents include those discussed at col. 5 lines 37-49. Shukis does not provide teachings that any of the chelating agents can be used in admixture.

First, it is noted that Shukis is completely silent as to using an organic additive and an acid in any process wherein the organic additive has a boiling point in the range of 80-500°C and a solubility in water of at least 5 grams per liter, measured at 20°C and atmospheric pressure. In fact, Shukis fails to teach the combination of any acid and organic additive. To the contrary, Shukis teaches the use a single chelating agent in all embodiments.

Applicants now turn their attention to the Examiner's conclusions. With regards to Table 1, applicants first note that only single compounds are used in all Examples. In addition, applicants note that all compounds other than EDTA are comparative examples of the invention. Applicants direct the Examiner's attention to col. 8 lines 6-15 wherein Shukis discusses that the only samples wherein the nanocrystalline phase desired by the Shukis invention was visible are those using EDTA. In particular Shukis states:

“...only one chelating agent of this set, EDTA, brought about a significant increase in catalytic activity (samples E4 and E5). Similarly, in parallel with the catalyst activity results, Analytical Electron Microscopy (AEM) showed clear evidence for the presence of the “nanocrystalline” phase of alumina in the EDTA treated and aged samples but not in the alumina of the other samples treated with other agents...”

In addition to lacking any teaching whatsoever to use more than one chelating agent, one having ordinary skill the art would not combine the teachings of any Examples other than samples E3 and E4 with the teachings of Shukis. In addition, there is no teaching in Shukis that any such combinations would work. Thus, in addition to providing no support for using the combination of an acid and an organic additive, much less an organic additive meeting the present claim limitations and an acid, Shukis would specifically teach away from using additives from any Examples other than E4 and E5, which both use EDTA.

With regards to Table 4, applicants respectfully point out that Examples 2 and 5, apparently the Examples referenced by the Examiner, do not show significant improvements over the standard catalyst. As can be seen in Table 4, the RVA for a catalyst treated without a chelating agent was

101, where Example 2 treated with nitilotriacetic acid had an RVA of 102, and Example 5 treated with Ethylene Glycol had an RVA of 106. In addition to providing no support for using the combination of an acid and an organic additive, much less an organic additive meeting the present claim limitations and an acid, Shukis would specifically teach away from using additives from Example 2 and Example 5 since they did not show any significant improvement, noting the improvements achieved in Examples 3, 6, and 7.

The Examiner is requested to reconsider and withdraw this rejection.

Based on the preceding amendments and remarks, the Examiner is requested to reconsider and withdraw all rejections and objections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted,

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